



Expert Report of  
Charles L. Blake, CIH

Assessment of Libby PD Claims for Evidence of Hazard

Charles L. Blake, CIH  
Bureau Veritas/Clayton Group Services, Inc.  
3380 Chastain Meadows Parkway  
Suite 300  
Kennesaw, Georgia 30144

January 16, 2007



### EDUCATION/EXPERIENCE/QUALIFICATIONS

I am Vice President and Director of Technical Services for Bureau Veritas/Clayton Group Services, Inc., 3380 Chastain Meadows Parkway, Suite 300, Kennesaw, Georgia 30144. I have been employed at Clayton since 1978.

I received my Bachelor of Science Degree in Chemical Engineering from the Worcester Polytechnic Institute in 1967. Prior to joining the Clayton, I was employed in industry and served in the US Army. From 1973 to 1978 I was a corporate staff engineer at Helena Chemical Company. In the course of my employment at Helena, I performed pesticide formulation plant design including waste water and emission control systems and functioned as corporate industrial hygienist. I also conducted industrial hygiene surveys and designed worker protection systems for the company. From 1972 to 1973 I was a Chemical Engineer Industrial Hygienist at The Aetna Insurance Company. My professional work prior to 1972 was as a chemical process engineer with EI du Pont de Nemours.

I obtained my certification as a CIH in 1977 and have maintained that certification continuously for the past 29 years.

Beginning in 1972, I conducted my first industrial hygiene survey of asbestos product manufacturing operations, wherein I gathered worker airborne fiber exposure data for comparison against the then recently established Occupational Safety and Health Administration (OSHA) standard for asbestos. My career with Clayton has included work involving nearly all aspects of industrial hygiene; however, matters involving asbestos have comprised the majority of my professional practice. This has included measurements of airborne asbestos concentrations in workplace and other settings ranging from manufacturing plants, refineries and



chemical plants to schools, office buildings, private homes, apartment buildings, automobile repair shops and others. In addition, I have conducted basic research on the subject of reintrainment of asbestos fibers from surfaces. My other asbestos related research has focused on workplace exposure. I am published in the peer-reviewed literature on matters involving worker exposures to asbestos.

I have also personally inspected nearly 1,000 buildings for the presence of asbestos and asbestos-containing building materials. When working with building owners and managers I have developed operations and maintenance plans for assuring safe occupancy and usage of facilities which have asbestos-containing materials.

I have been accepted as an expert witness in Federal and State courts to provide testimony in matters involving asbestos and other industrial hygiene related matters. The fee charged by my employer for consulting services, including expert testimony, is \$260.00 per hour.

For further information on my qualifications and publications, see the curriculum vitae attached hereto as Exhibit A.

#### EXECUTIVE SUMMARY

I was asked to review certain Asbestos Property Damage Claims ("PD Claims") filed in the W.R. Grace bankruptcy for properties located in Libby, Montana, and to opine on whether the claims present data that demonstrate the presence of an unreasonable risk of harm to claimants. It is my understanding that these claimants are asserting PD Claims based on the



alleged presence of asbestos on their properties as a result of Grace's vermiculite mining, milling or processing facilities.<sup>1</sup> Fifty-one separate PD claims were reviewed, each documented on a 5-part claim form. Forty of these claim forms referenced property inspections by the EPA, but only 13 included documentation of such inspections.

Some manner of sampling was indicated for 37 of the subject properties, although results of sample analysis were only available for 13 properties. For those claims where analytical results were available, only three of the six area air samples collected showed detectible concentrations of what was reported as being tremolite/actinolite fibers. The highest indicated concentration was 0.0082 f/cc. None of the air samples taken and analyzed appear to relate to any outdoor activities. Available results of analysis for 44 settled dust samples reported the presence of tremolite/actinolite fibers in only ten. Of 25 soil samples analyzed, only nine reported the presence of any asbestos fibers. Most of the claims made described the presence of visible vermiculite in soils on the properties. Much of this outdoor vermiculite was associated with gardening or flower bed related activities. Settled dust sampling was most often done within homes where vermiculite attic or wall insulation materials were present.<sup>2</sup>

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<sup>1</sup> It is my understanding that claims alleging the presence of ZAI in homes are not at issue in this proceeding, and therefore I have not considered those allegations for purposes of my report.

<sup>2</sup> I have not addressed Claim No. 009658 [THE PARKER PROPERTY], which I understand involves a property that has been remediated by the EPA. Thus, any data submitted with that claim, even taken at face value, are no longer operative for that property.



Based on the above described review, I have arrived at the following opinions that I hold to a reasonable degree of scientific certainty:

1. No scientifically reliable data have been submitted by the PD claimants with properties in Libby, Montana demonstrating that they have been, or are at any unreasonable risk of harm from exposure to asbestos arising from disturbance of soil and soil-like media on their properties. These soils and soil-like media are alleged to contain amphibole materials from Grace's mining, milling or processing facilities in Libby.
2. Use of Federal Government (OSHA, MSHA and EPA) permissible exposure limits for human exposure to asbestos in evaluating potential risk levels to Libby residents, is appropriate and suitably conservative.
3. No reasonable scientific conclusions can be drawn regarding any potential airborne asbestos fiber exposure to Libby PD claimants from asbestos in soil or soil-like media on their properties.
4. Findings of asbestos fibers in settled dust cannot be used to indicate the Libby PD claimants' airborne asbestos exposure potential.
5. There is no scientifically reliable basis to correlate alleged findings of amphibole asbestos in soil or soil-like media with any meaningful potential for a Libby PD claimant's exposure to airborne asbestos fibers.
6. The analytical data for air, dust and bulk samples presented with the subject PD claims include non-asbestos particles and thus are not reliable.

## DISCUSSION

### A. Background



As a result of my training and experience, I am familiar with the various methods, technology and terminology used for measuring asbestos fiber concentrations in air. From the reported scientific literature and my own work, I am also familiar with airborne asbestos levels in various settings, including the ambient air, buildings and industrial facilities. I am also familiar with the release of asbestos fibers from materials or media containing asbestos and potential for reentrainment of particles. My work also requires me to be familiar with the current and historical standards, policies and regulations applicable to asbestos and asbestos-containing materials.

It is well established that it is not the mere presence of asbestos that makes asbestos a health risk, but the theoretical possibility of inhalation of large quantities of airborne asbestos fibers over a lengthy period of time by persons. Assessing the potential for exposure to asbestos fibers requires considering several factors, including: (1) the quantity of asbestos-containing materials or media present; (2) the type and composition of those materials or media containing asbestos; (3) the condition of the materials or media; (4) the location of the materials or media; and (5) the potential for fiber release from the activities which impinge these materials or media. One can best determine the level of exposure potential only after completing an assessment of those factors, along with a properly designed and conducted air sampling program.

It is important to understand that for inhaled potentially toxic agents such as asbestos, the critical determination is the actual dose, which is the average airborne concentration inhaled, multiplied by the time over which it is inhaled. To determine actual asbestos fiber dose, it is necessary to conduct air sampling to measure the airborne exposure levels, both past and present, then separately determine the overall duration of such exposure. To measure airborne asbestos



fibers, air is drawn by a pump through a filter which captures any asbestos fibers as well as other types of particles in the air. By determining the amount of air that is pumped through the filter and the number of fibers on the filter, one can calculate the amount of material captured per the volume of air and thereby express the airborne concentrations. Measurements are taken for eight hours over the course of a day in order to determine a time-weighted average exposure. During an eight-hour day, there may be one or more peaks in exposure in which the amount of asbestos in the air is higher than average, but it is the average exposure over the full work shift which is used to assess risk of disease.

The OSHA and MSHA asbestos standards require representative air sampling to assess worker airborne fiber exposures. The EPA recognizes air sampling as a tool to be used along with visual inspections to assess the risk of exposure posed by the presence of asbestos-containing materials in buildings. EPA also requires air sampling after removal of asbestos-containing materials to clear a school building for re-occupancy. Significantly, no federal agency has enacted a regulation establishing a legal standard for the permissible or maximum allowable level of asbestos in soil.

Regarding asbestos, it is not the material that is visible to the naked eye that is important in determining any potential hazard. Rather, it is that which is actually breathed by the individual and retained in the deep lung. If material such as dust and debris can be seen, it is too large to enter the lungs. For this and other reasons, quantification of dust on surfaces is not an accurate measurement of hazards to people in the area. There is no meaningful association between asbestos fiber concentrations in settled dust and health risks to persons in the area of such surface dust. Also, there is no meaningful association between surface dust sample asbestos



fiber concentrations and the level of possible exposure of individuals to airborne fiber concentrations. In short, settled dust analyses do not provide any basis for determining whether any asbestos inhalation hazard exists.

Respirable sized dust particles adhere to the surface on which they are settled and are not removed, even with great force. Settled dust measurements should not be used to estimate inhalation risks because the composition of settled dust can be entirely different from what is in the air. Since the 1960s, no new evidence has been found to contradict this conclusion. No government agency has mandated the use of asbestos-settled dust sampling as a tool for assessing the safety and habitability of a building.

For the same reasons, merely quantifying asbestos concentrations in soil or soil-like media fails to provide reliable evidence or data that, taken alone, would accurately predict asbestos fiber exposure potential via suspension or re-entrainment of asbestos in ambient air as a result of disturbance of said soil or soil-like media.

Today, workers' and miners' exposures to asbestos-containing materials are regulated by OSHA and MSHA. Prior to 1972, it is estimated that occupational exposures in certain industries were, on average, 20 to 25 fibers per cubic centimeter (f/cc). In May 1971, the newly established OSHA adopted an emergency temporary standard for asbestos of 12 fibers per cubic centimeter (f/cc) over an 8-hour Time Weighted Average. For this and all following OSHA asbestos exposure limits, OSHA has defined a "fiber" as a particle 5 micrometers long or longer with a minimum aspect ratio of 3:1. This emergency standard was lowered to 5 f/cc in December of that same year. In 1972, OSHA adopted a permanent specification standard for asbestos with a 5 f/cc 8-hour Time Weighted Average PEL (Permissible Exposure Limit) and a



10 f/cc ceiling concentration limit. In 1976, OSHA lowered its 8-hour Time Weighted Average PEL from 5 f/cc to 2 f/cc. In 1986, OSHA changed its PEL for asbestos to 0.2 f/cc 8-hr Time Weighted Average, and in 1988 introduced a 1.0 f/cc "excursion limit" averaged over a 30-minute exposure period. In 1994, the 8-hour PEL was reduced to 0.1 f/cc. The current OSHA standard permits a person to be exposed up to 0.1 f/cc of airborne asbestos for eight hours a day, fifty weeks a year, over a working lifetime up to 45 years duration. This equates to 90,000 hours of continuous exposure to airborne asbestos and yields a lifetime airborne fiber dose of 4.5 f/cc x years (or 4.5 fiber years).

Similarly, the government has established permissible exposure limits to asbestos for miners. MSHA's asbestos regulations date back to 1967 when the Bureau of Mines, predecessor to the Mining Enforcement and Safety Administration (MESA), set a dust exposure standard of 5 mppcf (million particles per cubic foot of air). In 1969, the Bureau of Mines promulgated a standard of 2 mppcf or 12 fibers/ml. In 1974, the standard was lowered to 5 fibers/ml, dropping the 2 mppcf dust limit. In 1976, MESA issued what is now the current standard of 2 fibers/ml. During 1977 health and safety issues regarding mines and mining operations were transferred to the Department of Labor and assigned to MSHA. Thus, during the period 1976 to the present, MESA and MSHA permitted human exposure at a level of 2.0 f/cc for a working lifetime.

The OSHA and MSHA PEL's are the dividing line between legally acceptable and non-acceptable conditions (in federally regulated work places) and are the basis for compliance with OSHA's and MSHA's asbestos standards.

During the 1980's the US EPA, under its Asbestos Hazard Emergency Response Act (AHERA) regulations, established a 0.01 f/cc clearance limit as a measure of acceptability and



habitability of space following an asbestos abatement action. More recently, the EPA has identified 0.01 f/cc as its Asbestos Screening Level, pursuant to which the EPA finds airborne asbestos exposures at this level acceptable for continuous periods -- 24 hours per day, 7 days per week, up to 1-year duration. The EPA has also stated that, "Individual air sample results greater than the screening level do not imply an immediate health threat."

#### B. Evaluation of Libby PD Claims Data

Based on my review of the Libby PD Claims provided to me, I am of the opinion that:

1. The Libby PD claimants are not at any unreasonable risk of harm from the disturbance of soil or other soil-like media that are alleged to contain amphibole materials from the Libby vermiculite mining, milling or processing facilities. There is only an insignificant possibility that sustained exposure to airborne fibers would occur. It is possible that intermittent, short duration disturbances of such soil or other soil-like media could result in short-term exposures of airborne fibers in the breathing zone of the individual. Even if the individual is unprotected, such intermittent exposure during these limited disturbances would not result in significant airborne fiber dose levels and, thus, would not have any health significance. My opinion is based upon my observation that, among other things: (i) with two possible exceptions, the amphibole fiber contents of sampled soils and soil-like media are less than 1%, with no amphibole fibers even detected in most of the samples, ii) the soil sample analyses do not distinguish asbestos fibers from non-asbestos particles and, based on the work of R.J. Lee



Group,<sup>3</sup> many of the amphibole particles purportedly found in soils and soil-like media in Libby are non-asbestiform and/or non-respirable particles, and (iii) the potential for disturbance appears to be intermittent and short duration, and would likely involve very low airborne fiber concentrations. Also, short-term emissions would be greatly diluted by the outdoor air.

2. There are no air sampling data to suggest that disturbance of soil and soil-like media present in Libby would result in airborne asbestos levels that significantly exceed levels deemed permissible in federally regulated work places, by federal agencies and their regulations. To the contrary, the only air data in the claims files are derived from indoor air samples. As described above, OSHA's 0.1 f/cc 8-hour TWA PEL applies 8 hours per day, 40 hours per week, 50 weeks per year for 45 years, thus allowing a cumulative airborne fiber dose of 4.5 f/cc x years over a working lifetime. The OSHA standards, while not eliminating all disease risk, reduce such risk to a low and acceptable level. Also, it is highly unlikely that today's workers will be occupationally exposed to asbestos over a sustained 45-year period, thus making actual risk levels even lower.

It is not foreseeable that any activities by Libby claimants that disturb soil or soil-like media alleged to contain asbestos would involve daily exposures for 40 hours a week, 50 weeks a year over a 45 year working life. For this and other reasons, utilizing the OSHA PELs for the evaluation of the alleged exposures in Libby would be an appropriate and suitably conservative approach.

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<sup>3</sup> Expert Report of Richard J. Lee, Ph.D., In the matter of United States of America v. W.R. Grace, et al. CR-05-070M-DWM (D. Montana)



3. Non-asbestos amphibole particles can be distinguished from asbestiform fibers and this distinction must be made when attempting to assess potential exposures to regulated "asbestos." Also, non-asbestos particles are not included within the regulatory definition of "asbestos." The difference between asbestiform minerals and their non-asbestos analogues have been well recognized by the regulatory agencies. In a special ruling made during 1992, OSHA excluded these non-asbestos analogues from its asbestos regulations due to a lack of evidence that such non-asbestos fragments are hazardous to human health. As a result of extensive hearings and rulemaking proceedings, only the asbestiform varieties of certain amphiboles are regulated. Thus, when attempting to assess the potential for exposure to asbestos and any related health risks from the disturbance of soil or soil-like media alleged to contain amphibole asbestos, the evaluator must, in accordance with sound industrial hygiene practice and proper air sampling methodology, distinguish between asbestiform fibers and non-asbestiform amphibole particles and only include asbestiform fibers in the determinations of airborne fiber concentration. The analytical data for soil, air and dust samples reported on claim forms include both non-asbestiform and non-respirable particles and thus are unreliable for use in assessing any health risk to occupants.

4. Simple findings of asbestos in soils, taken alone, cannot be used to accurately predict or reliably estimate airborne asbestos exposure levels. In fact, researchers employed by the EPA to study the relationships between bulk material asbestos content for soils in Libby and potential airborne asbestos levels found it was not possible to compute quantitative transfer factors for asbestos fiber releases from soil.



5. Even if the samples of soils from claimants' properties are taken at face value, they were reported to contain very low concentrations of amphibole fibers. More than half of the 25 samples collected showed no detectable amphiboles. Moreover, typical owner/resident activities have not been shown to cause redispersion of soil bound amphibole fibers such that personal exposures would occur. Any exposure as a result of disturbance of such soil would likely be intermittent, of short duration and to low concentrations of airborne asbestos which indicates a risk less than those usually regulated by EPA and not sufficiently high to be regulated by OSHA.

6. Findings of asbestos in settled dust found on the interior surfaces of the Libby claimants' residences do not demonstrate levels of asbestos in the air, and give no insight into what concentrations of asbestos people might breathe. Thus, they are of no relevance in the assessment of a health risk. When tasked with determination of dust-to-air transfer rates, researchers employed by EPA found the relationships between asbestos content of settled dust and airborne asbestos fiber concentrations to be highly variable. A factor in this variability is the use of indirect sample preparation for analysis of asbestos in settled dust. The ASTM in its published methods for determination of the asbestos content of settled dust states that: "At present, no relationship has been established between asbestos containing dust as measured by this test method and potential human exposure to airborne asbestos." As a result, the Libby PD claimants' submission of surface dust sample results does not establish exposure or potential exposure to hazardous levels of airborne asbestos.

In addition to the description set forth above, my extensive background and experience in this area, my education, and the literature in my fields of expertise, including my own writings



and work, I may also rely on or comment on publications, opinions, data and materials produced in discovery or contained in reports of other experts designated by the claimants or Grace in this action, and I reserve the right to amend or supplement this report as necessary.



Charles L. Blake  
Charles L. Blake, CIH



**Charles L. Blake, CIH**  
**Vice President, Director, Technical Services**

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**AREA OF EXPERTISE**

Experienced in aspects of industrial hygiene practice, consultation, and program management and research. Has been admitted as an expert witness in industrial health, toxic tort and environmental liability matters tried in local, State, and Federal Courts. Maintains specific expertise in asbestos, pesticides, crystalline silica, ethylene oxide, carbon monoxide, and hazardous materials handling, control, and abatement matters.

**EDUCATION**

B.S., Chemical Engineering, 1967  
Worcester Polytechnic Institute  
Worcester, Massachusetts

**PROFESSIONAL REGISTRATION/CERTIFICATION**

Certified Industrial Hygienist, ABIH, No. 1242 (Comprehensive Practice)

Commercial Pilot rated for instrument flight in single and multi engine aircraft, 4,000 hours flight experience

**PROFESSIONAL EXPERIENCE**

**Bureau Veritas**  
**Clayton Group Services, Inc.**  
Kennesaw, Georgia  
2005 to Present

**Clayton Group Services, Inc.**  
Kennesaw, Georgia  
1994 to 2005

**Clayton Environmental Consultants, Inc.**  
Marietta and Kennesaw, Georgia  
1981 – 1994

As Vice President, Director Technical Services, responsible for special projects development, performance, technical and administrative coordination; business activities, technical direction, staff development, and supervision, for this regional industrial hygiene and environmental consulting practice



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### **PROFESSIONAL EXPERIENCE (CONTINUED)**

- Performs detailed industrial hygiene and environmental surveys, audits, and studies.
- Evaluates and designs manufacturing/processing facilities, formulation equipment, ventilation, and emission control systems, for the metals and chemical processing industries.
- Selects, makes recommendations, and performs tests for use of personal protective equipment.
- Researches and develops technical data and provides expert testimony in occupational and environmental health-related litigation.

#### **Clayton Environmental Consultants, Inc.**

Southfield, Michigan

1978 to 1981

As Group Leader, Assistant Manager of Industrial Hygiene Services, responsible for staffing, scheduling, and administrative activities.

- Performed detailed industrial hygiene and environmental surveys, audits, and studies.

#### **Helena Chemical Company**

Memphis, Tennessee

1973 to 1978

As Corporate Staff Engineer, responsible for engineering, environmental health and safety activities and related compliance efforts.

- Directed the design and construction of seven separate pesticide formulation plants, and numerous manufacturing, packaging, ventilation, and emission control systems.
- Developed and designed hazardous waste treatment facilities for formulating and manufacturing plants.
- Performed industrial hygiene surveys, developed, and implemented in-house procedures and employee health standards.
- Represented Helena Chemical by serving on various committees within the National Agricultural Chemical Association. Participated in numerous standards writing activities.



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### **PROFESSIONAL EXPERIENCE (CONTINUED)**

#### **Aetna Insurance Company**

Hartford, Connecticut

1972 to 1973

As Chemical Engineer Industrial Hygienist, served as final engineering authority for underwriting and claim departments.

- Conducted industrial hygiene surveys.
- Provided complete engineering and industrial hygiene support. Assisted underwriting expansion into the asbestos floor tile, foundry, organic chemical, and natural gas.

#### **E.I. DuPont de Nemours & Co., Inc.**

Chattanooga, Tennessee

1967 to 1971

As a Process Engineer, responsible for operation and development of a continuous process nylon production system.

### **MILITARY SERVICE**

United States Army 1968 to 1970

- Attained rank of Captain
- Served in Republic of Viet Nam in positions ranging from maintenance shop officer to Battalion S-4.

### **PROFESSIONAL AFFILIATIONS**

American Industrial Hygiene Association  
Georgia Section Past Treasurer

American Insurance Association  
Chemical and Special Hazards Committee

National Agricultural Chemicals Association  
OSHA Committee  
Effluent Guidelines Subcommittee



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### **PROFESSIONAL AFFILIATIONS (CONTINUED)**

National Asbestos Council  
Past Director  
Past Treasurer  
Sampling and Analytical Committee  
Past Chairman Survey and Specification Committee  
Society of Automotive Engineers

### **HONORS/AWARDS**

Pi Delta Epsilon (Journalism) and Scabbard and Blade (Military) Honor Societies

Awarded Bronze Star for U.S. Army Service in Republic of Viet Nam

### **PUBLICATION/PRESENTATIONS**

Indoor Air Quality Problems in Public Buildings, C.L. Blake, M.A. Coffman, and D.J. Heywood, presented at the American Industrial Hygiene Conference, Portland, OR, May 1981.

Exposures During Paint Spraying in Lateral Flow and Downdraft Auto Repair Shop Paint Spray Booths, A.W. Eissler, C.L. Blake, presented at the American Industrial Hygiene Conference, Portland, OR, May 1981.

A Discussion of Six Indoor Air Quality Studies in Public Buildings, D.H. Montgomery, C.L. Blake, J. Singh presented at the American Industrial Hygiene Conference, Cincinnati, OH, June 1982.

An Investigation of Health Concerns and Environmental Measurements in a Large Office Building, M.S. Levine, M. Corn, C. Billings, Johns Hopkins University; J.Singh, C.L. Blake, Clayton Environmental Consultants, Inc., presented at the International Symposium on Indoor Air Pollution, Health and Energy Conference, Amherst, MA, October 1981.

Removal of Asbestos from Public Buildings, C.L. Blake, presented at the Joint Conference on Occupational Health, Salt Lake City, UT, September 1984.

Confining and Minimizing Airborne Fibers, C.L. Blake, delivered at the Georgia Tech Research Institute Asbestos Symposium, Atlanta, GA, March 1983.



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**PUBLICATION/PRESENTATIONS (CONTINUED)**

Asbestos Materials in Buildings, Operations & Maintenance Planning, delivered at the University of South Carolina, Columbia, SC, October 1983.

An Evaluation of the Garrett TPE 331 Engine's Potential for Turbine Oil By-Product Contamination of An Aircraft Cabin Environmental System, National Transportation

Safety Board Special, Investigation Report #NTSB/SIR-84/01, January 1984, Note: Mr. Blake was lead investigator for Clayton Environmental Consultants, Inc's. contribution to this report.

Prevalent Level, Personal and Area Air Monitoring, delivered at the Georgia Tech Research Institute Asbestos Symposium, Atlanta, GA, August 1984.

Asbestos, Hidden Hazards, delivered at Georgia Institute of Technology, Graduate School of Civil Engineering, Atlanta, GA, January 1985.

A Study of Contamination of Jet Powered Aircraft Cabin Environments, delivered at American Industrial Hygiene Association (AIHA) Georgia Section Meeting, Atlanta, GA, January 1985.

Monitoring Pressure Differentials on Asbestos Abatement Projects, delivered at the Georgia Institute of Technology Asbestos Symposium, Atlanta, GA, March 1986.

Asbestos Abatement and Removal: Legal Considerations and Planning, presented with Lloyd Fox, Esq. at Engineering News Record Seminar, Washington, DC, November 1986.

Air Sampling Analysis Procedures, Air Sampling Methods and Procedures, delivered at the American Wall and Ceiling Institute, Asbestos Abatement World Congress, Washington, DC, January 1987.

Regulatory Update: Federal and State Asbestos Requirements, delivered at the Georgia Tech Institute Asbestos Symposium, Atlanta, GA, March 1987.

Achieving Compliance with OSHA Standards, delivered at the Georgia Tech Research Institute, Brake and Clutch Seminar, Atlanta, GA, August 1987.

AHERA: Selecting Response Actions, delivered at Georgia Tech Research Institute, AHERA Inspection and Management Planner Certification Course, Atlanta, GA, November 1987.



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**PUBLICATION/PRESENTATIONS (CONTINUED)**

AHERA: Evaluating and Implementing Response Actions, delivered at Georgia Tech Research Institute AHERA Seminar for LEA Representatives, Atlanta, GA, February 1988.

Environmental Liability: New Chemical Regulations, delivered to the Risk and Insurance Management Society, Inc., Piedmont Chapter, Greensboro, NC, March 1988.

Asbestos in Buildings, delivered to the Institute for Real Estate Management, Orlando, FL, April 1988.

Insights Regarding Asbestos Litigation, delivered to BKR International, Atlanta, Georgia, September 1993.

Asbestos Exposure of Building Maintenance Personnel, Mlynarek, S., Corn, M., Johns Hopkins University, Blake, C. L., Clayton Environmental Consultants, Inc., *Regulatory Toxicology and Pharmacology*, Volume 23 #3, June 1996.

Taking the Client Where They Need (Rather Than Want) to Go, Leadership Roles in Consulting, delivered at the Professional Conference on Industrial Hygiene, New Orleans, Louisiana, September 1999.

Assessment of the Public Health Risks Associated with Candle Emissions, Blake, C. L., D. J. Silver, and R. D. Harbison, *The Toxicologist*, Volume 60: 198, 2001. (Abstract)

Automobile Brake Maintenance and Airborne Chrysotile Fiber Exposures, Banasik, M., Van Orden, D., Blake, C.L., Harbison, R.D., *The Toxicologist*, Volume 72: S-1, 2003. (Abstract)

Airborne Asbestos Concentration From Brake Changing Does Not Exceed Permissible Exposure Limit, Blake, C.L., Van Orden, D., Banasik, M., Harbison, R., *Regulatory Toxicology and Pharmacology*, Volume 38, (2003) 58-70, August 2003.

Assessment of Asbestos Exposure Among Automotive Mechanics Servicing and Handling Asbestos-Containing Gaskets, Blake, C.L., Dotson, G., Harbison, R., *The Toxicologist*, Volume 90: Number 1, p. 853, 2006. (Abstract)

Assessment of Airborne Asbestos Exposure During the Servicing and Handling of Automobile Asbestos-Containing Gaskets, Blake, C.L., Dotson, G.S., Harbison, R.D., *Regulatory Toxicology and Pharmacology*, Volume 45 (July 2006) 214-222.

## TRIAL TESTIMONY

DATE	VENUE	CASE NAME	ACTION / REPRESENTING	NOTES
Aug 9 & 12, 2002	Los Angeles, CA	Susan MacDonald v. Worthington	Asbestos Personal Injury Defendant	Associated deposition given July 16, 2002
October 24, 2002	Seattle, WA	Patrick Campbell v. Honeywell	Asbestos Personal Injury Defendant	Associated deposition given Sept 27, 2002
March 10, 2003	Seattle, WA	Creech v. Ford & Chrysler Motors	Asbestos Personal Injury Defendant	Associated deposition given Feb 4, 2003
March 18, 2003	San Francisco, CA	Broe v. Fields	Commercial lease - asbestos related Plaintiff	
April 10, 2003	San Francisco, CA	Fields v. Brow	Alleged Asbestos Exposure Defendant	Associated deposition given Feb 25, 2003
June 24, 2003	Seattle, WA	Pedrick	Asbestos Personal Injury Defendant	
	Griffith	v. Ford and Chrysler Motors		
August 15, 2003	Marietta, GA	Willie Lee Robinson v. Honeywell & General Motors	Asbestos Personal Injury Defendant	Associated deposition given Apr 1, 2003
September 10, 2003	Jacksonville, FL	Mary Ellen Tyre, Individually and as Executrix of the Estate of Royce A. Tyre, deceased; Stephen T. Tison; Troy Hickox; Judy E. Murray, Individually and as Executrix of the Estate of Ernest E. Murray; James A. Wood; Clyde Varnadore; Robert Gerald Lear; and Gloria V. Williamson, Individually and as Executrix of the Estate of Carl Williamson, deceased v. CSX Transportation, Inc.	Asbestos Personal Injury Defendant	Frye Hearing - Associated deposition given Sep 3, 2003
April 14, 2004	Atlanta, GA	Rose Pinkston v. Kellogg	Asbestos Personal Injury Defendant	Worker's Comp Board
February 2, 2005	Easton, PA	Elaine B. Novak (Personal Representative	Asbestos Personal Injury	

## DEPOSITION TESTIMONY

DATE	VENUE	CASE NAME	ACTION / REPRESENTING	NOTES
May 22, 2002	Bay Area, CA	Ferrari v. Hamilton Materials	Asbestos Personal Injury Defendant	
June 4, 2002	Bay Area, CA	Richard Batterman v. Honeywell	Asbestos Personal Injury Defendant	
July 31, 2002		Ruth B. McQuillin v. Honeywell	Asbestos Personal Injury Defendant	
August 2, 2002	Bay Area, CA	Richard Woodcock v. White Consolidated Industries	Asbestos Personal Injury Defendant	
August 23, 2002		Hill vs.	Asbestos Personal Injury Defendant	
August 29, 2002	West Virginia	West Virginia Asbestos Personal Injury Ligation v. Honeywell	Asbestos Personal Injury Defendant	
September 5, 2002	Bay Area, CA	Kevin Nelson v. Henry's Kevin Nelson v. Honeywell - Vol II	Asbestos Personal Injury Defendant	Vol II given December 19, 2002
September 25, 2002		Elmer Royer v.	Asbestos Personal Injury Defendant	
October 7, 2002		Banetta v.	Asbestos Personal Injury Defendant	
October 10, 2002	Providence, RI	Schaun v. Worthington Pump	Asbestos Personal Injury Defendant	
October 30, 2002	San Francisco, CA	Inga Shreck v. Honeywell	Asbestos Personal Injury Defendant	
November 21, 2002	Oakland, CA	Matthew Schott v. Honeywell	Asbestos Personal Injury Defendant	
December 10, 2002		Tims v. Honeywell	Asbestos Personal Injury Defendant	
January 3, 2003		Kluchuck v. Honeywell	Asbestos Personal Injury Defendant	
January 31, 2003		Bernard v. Honeywell	Asbestos Personal Injury Defendant	
February 10, 2003		Forbes v. Honeywell	Asbestos Personal Injury Defendant	Vol I
February 14, 2003		Forbes v. Honeywell	Asbestos Personal Injury Defendant	Vol II
March 17, 2003		Beal v. Honeywell	Asbestos Personal Injury Defendant	

April 23 or 25, 2003		Holder v. Honeywell	Asbestos Personal Injury
May 2, 2003		Baumgarten v. Honeywell	Asbestos Personal Injury
June 13, 2003		Hopkins v. Honeywell	Asbestos Personal Injury
June 30, 2003		LaValle v. Honeywell	Asbestos Personal Injury
July 3, 2003		? v. Worthington pump?	Asbestos Personal Injury
August 12, 2003		Valdesquez v. Ingersoll Rand Pump and Honeywell	Asbestos Personal Injury
October 30, 2003	New Orleans, LA	Bartucci v. Honeywell	Asbestos Personal Injury
December 30, 2003	Little River County, AR	George Adams v. Honeywell	Asbestos Personal Injury
February 11, 2004	New Orleans, LA	C. Ann Jones v. Honeywell	Asbestos Personal Injury
March 3, 2004	Seattle, WA	Gerald & Sharon Irleton v. Kalsar Ventura	Asbestos Personal Injury
March 10, 2004	Texas	Frank Rixse	Asbestos Personal Injury
March 28, 2004	New Orleans, LA	Lindward Fremlin ET UX, v. Rockbestos Estate of Jesse Towler v. Chicago Bridge & Iron	Asbestos Personal Injury
March 30, 2004	W.VA	Boggs v. Honeywell	Asbestos Personal Injury
June 4, 2004	Wharton County, TX	Debra Farmsworth v. Honeywell	Asbestos Personal Injury
June 7, 2004	McLean County, IL	Ronald & Elizabeth Compton v. Honeywell	Asbestos Personal Injury
August 27, 2004	LA County, CA	Treggatt v. Sterling Fluid Systems, Ingersoll Rand Pumps Honeywell	Asbestos Personal Injury
October 8, 2004	Los Angeles, CA	James & Sharon Leasy v. Honeywell	Asbestos Personal Injury
November 18, 2004		Freida Slaughter v. The Budd Company	Asbestos Personal Injury
November 28, 2004	New Orleans, LA	Ester Bishop v. Honeywell	Asbestos Personal Injury
February 9, 2005	King County, WA	Alvin & Pauline Jensen v. International Can	Asbestos Personal Injury
February 16, 2005	Cuyahoga County, OH	Robert Laach v. Honeywell	Asbestos Personal Injury

March 29, 2005	Baltimore, MD	Charles E. Flax v. Honeywell	Asbestos Personal Injury Defendant
April 15, 2005	Madison County, IL	Robert E. Abernathy and Sharon Abernathy v. Cerro Copper Products Company	Asbestos Personal Injury Defendant
April 20, 2005	Middlesex County, MA	George C. Bouhanna v. Honeywell	Asbestos Personal Injury Defendant
April 22, 2005	W.VA	Asbestos Personal Injury Litigation May 2005 Trial Group	Asbestos Personal Injury Defendant
May 26, 2005	Los Angeles, CA	John Suprenant, et al. vs. 20th Century Fox Warner Brothers	Asbestos Personal Injury Defendant
June 29, 2005	San Francisco, CA	Peter Galassi v. Crane Valves Alpha Laval Separators	Asbestos Personal Injury Defendant
July 15, 2005	Los Angeles, CA	Helen Griffin v. Goulds Pumps	Asbestos Personal Injury Defendant